

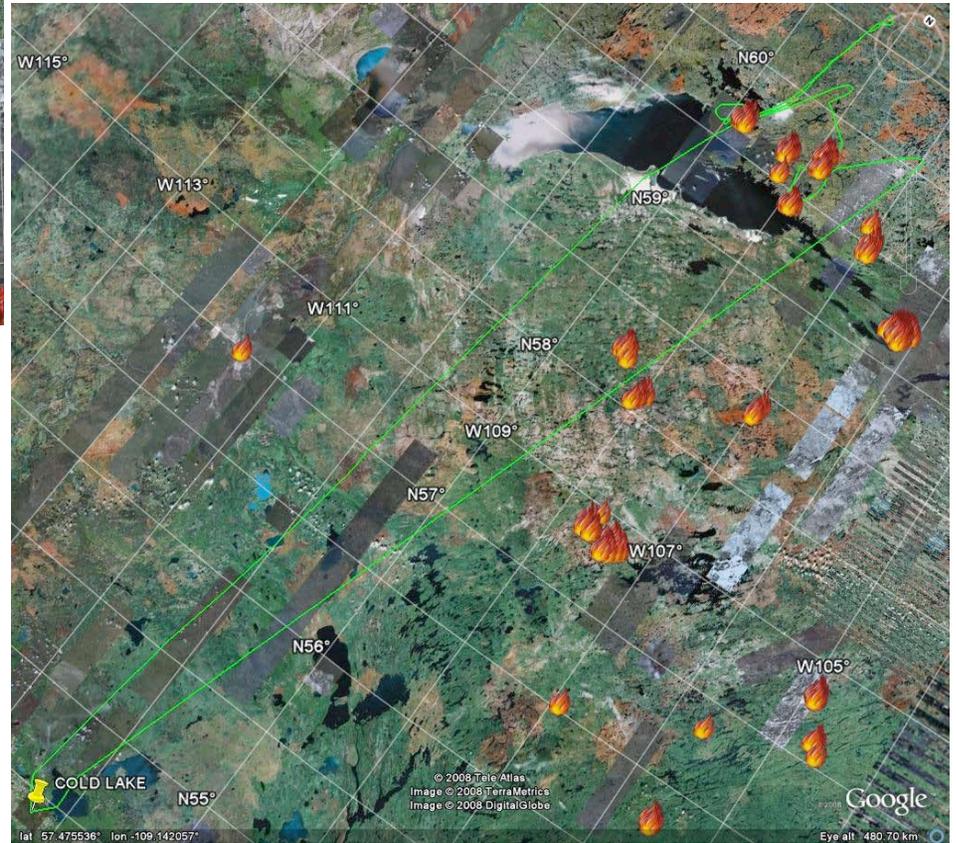
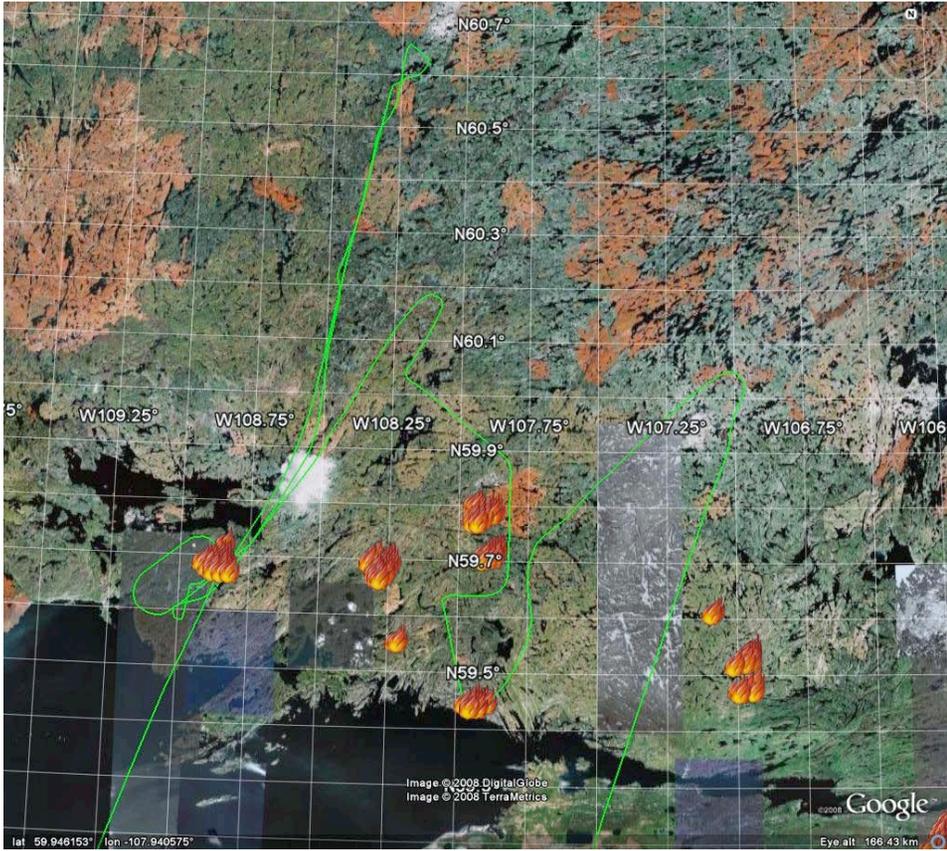
Flight Report
ARCTAS P-3B Data Flight 15, flown 28 Jun 2008 (ARCTAS Summer)
Submitted by Antony Clarke

Objectives

- 1) Test flight operations finding and sampling fires
- 2) Fly fire outflow at diverse altitudes and stages of development
- 3) CALIPSO intercomparison with B200
- 4) Fire plume underflight with B200 w/ P3b below
- 5) Radiation and AOD for clean and fire plume conditions

Sample of Photos courtesy Y. Shinozuka, C. McNaughton, S. Freitag





Time History

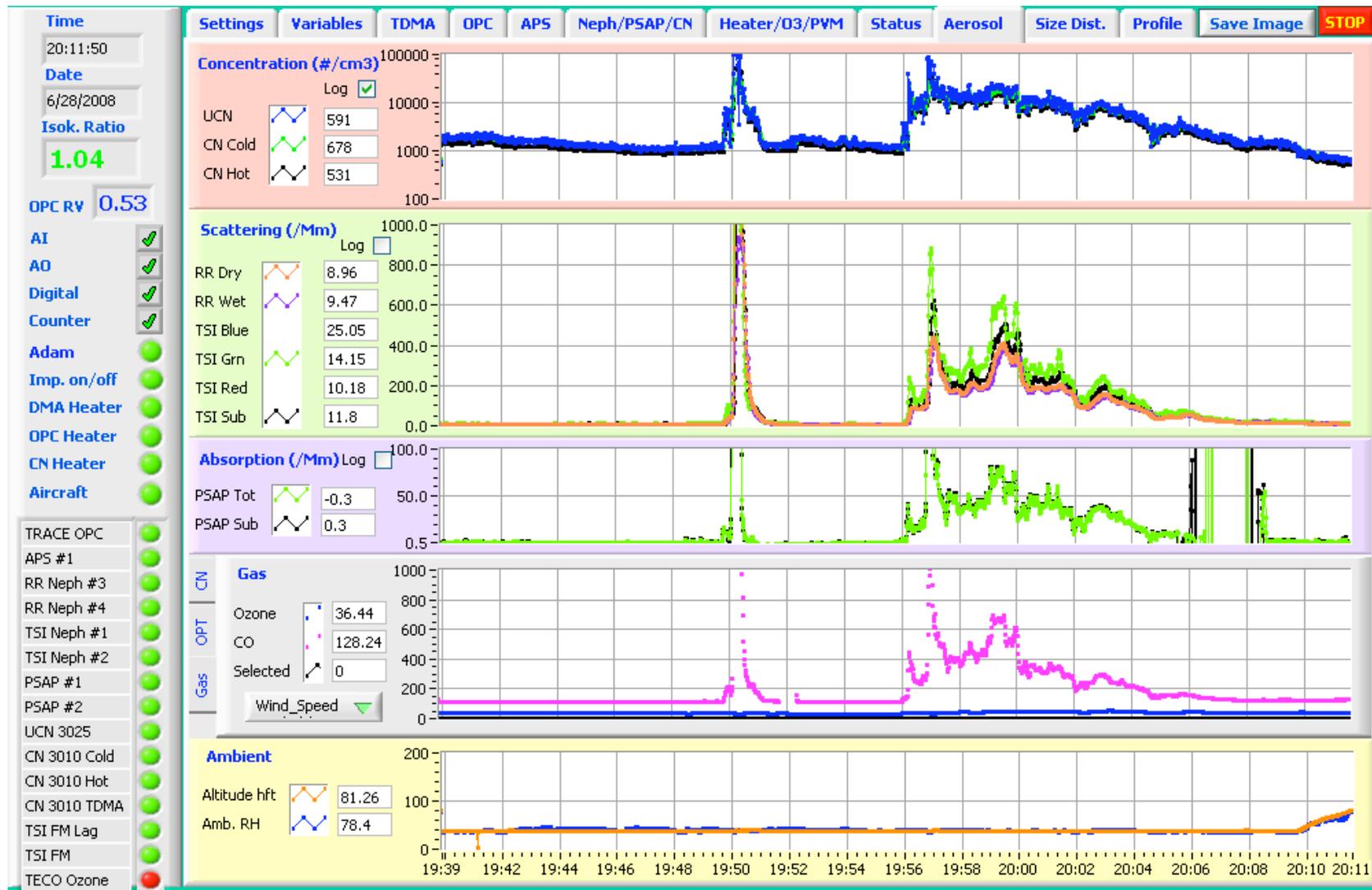
~HHMM

- 1841 UT TAKEOFF (12:41:32 LST) –
- ~1850 7000' high organic in AMS, low SSA, scattering 15 Mm-1
- ~1853 SO4 up, and f(RH) up
- ~1857 SO4 down CO~130
- ~1859 Climb to above cloud
- ~1902 10500' leg over cloud, CN drop from 2000 to 200, scatter from 10 to 1Mm-1, CCN down to 30/cc
- ~1912 Penetrate cloud, PVM response est. LWC = 0.2 ug/m3
- ~1915 Drop to 7500'
- ~1922 Drop to 2000'
- ~1925 Level at 2000' agl. Wind 20knt at 206 deg, PyroCumulus about 40 mi to east. evident
- ~1929 2000', CLEARLY TOO MANY CLOUDS FOR CALIPSO;CCN~800/CC
- ~1932 enhanced aerosol, ?downwind of Ft. McMurray industrial complex?
- ~1933 now SO₂ and CN and CCN
- ~1950 4000', HIT CENTER OF PYROCUMULI at 59 38'; -108 53'
- ~1956 circle and repeat at N. side of cumuli where entrainment is happening, scattering 700Mm-1
- ~2010 Break off plume run after scattering drops to 60 Mm-1.
- ~2015 Climb and reverse heading at base of clouds above plume.
- ~2028 Back over fire at 59 38', 108 53'
- ~2030 Drop to 1000'
- ~2037 B200 above us , heading 020 on plume
- ~2046 Turn 160 to get plumes downwind (to the NE) of a line of fires, Smoke up to 16,000'
- ~2052 Fly plumes of fire just overflowed by B200
- ~2054 Head to more fires to east about 59 39.3' -107 38'
- ~2057 Fly down axis of plume
- ~2100 Climb through plume to anvil outflow, Loose AMS (crash) for 30 min.
- ~2106 Darkened cloud outflow evident about 16,000.
- ~2108 Out of time, Head for home and climb
- ~2130 at 23,000' , larger aged BC in thin plume aloft, Siberian air?
- ~2137 In progress profile to surface
- ~2144 Into subcloud haze layer about 9200'
- ~2154 Low level 500' leg
- ~2202 climb to 8400'
- ~2206 fly just below cloud base
- ~2229 LAND

Summary

Excellent flight with many objectives met in exactly 4 hours. Successful B200 coordination over fires. Calipso coordination and some radiation measurements curtailed due to clouds aloft.

Example data from initial plume penetration (19:50) and down wind run in plume (19:56 – 20:10)



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Flight Report

Aircraft :	NASA P-3B
Operating Site(s) From / To :	KNUQ/CYOD/CYOD
Flight Date :	June 28, 2008
Flight Number / Data Flight # :	591/ ARCTAS Transit & Science Flight # 15
Time out:	1236 (L)
Time in:	1633 (L)
Flight Time :	4.0
Flt Request # / PI:	8P301/ Phil Russell
Purpose of Flight :	Data [X] Ferry [] Functional Check [] Other []
Sensor Payload :	ARCTAS (flight)
Comments :	Aircraft is in an up status and ready for the next flight. Flight 15 almost appeared destined for failure due lack of fuel delivery, flight planning software problems, last minute printer failures and an uncertain fire target. Thanks to the "can do" attitude of the pilots and the whole P3B crew our fuel limited 4 hr flight was a great success. Although clouds

	<p>conspired to prevent our radiation measurements and hampered the B200 lidar comparison, the target fires exploded into activity just as we arrived at the north side of Lake Athabasca. We successfully intercepted numerous fire plumes at multiple altitudes and stages of development with the B200 overhead. We completed plume penetrations in pyrocumulous, downwind runs in evolving plume outflow, stacked legs at low, medium and high plume altitudes and in outflow layers near cloud at about 15,000'. These multiple objectives were also completed during the active growth period of the fires, one of our ARCTAS times of interest. Kudos to all for making this flight a successful opening to our ARCTAS fire studies.</p> <p>REVEAL: Today's flight was really bumpy but surprisingly smooth for the REVEAL/Iridium systems. Xchat remained robust for the complete duration of the 4.0 hour flight. Xchat connection dropped once and was quickly restarted after the drop. Appears Larry and Mark Bradford have successfully tuned the system. Unfortunately the B200 was unable to send down data through its systems. Therefore the P3 was unable to conduct data uploading from the B200. The B200 information was relayed up to P3 through the people on the ground with Xchat. Data uplinks remained opened throughout the flight. DC8 was not flying therefore there was no DIAL data uploading. There is also no data traffic from B200. This leaves more bandwidth for P3 uplinks.</p>
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SUBMITTED BY: Colleen Kelly 28 June 2008

Flight Hours for ARCTAS Campaign

Flight	Date	Aircraft Flight #	Data Flight#	Duration (hr)	Remaining Hours*
<i>Total Allocated</i>					<i>90.3</i>
Reveal Test /Training Flight	6/13/2008	583	PCF 1	2.0	88.3
Transit To NUQ	6/19/2008	582	Trans	7.7**	No charge
PCF/Data	6/22/08	584	#11	3.5	84.8
CARB/Data	6/24/08	585	#12	8.0	76.8
ARCTAS Transit Flt	6/26/08	587	#13/14	6.6/.9	69.3
ARCTAS Science Flt	6/28/08	591	#15	4.0	65.3

*Allotted flight hours include the following:
 ARCTAS – 75 hours
 CARB – 8 hours
 Hours carried over from Spring ARCTAS – 7.3

** transit flight billed as a maintenance flight

Transit flight allow approx 5.5 hours to include customs clearance at Dover

Instrument Reports

AATS-14	AATS – 14 - Operational entire flight, but parked because of persistent cloud cover Check for 29 Jun 08
Status during flight (up/down)	
Accomplishments	
Issues encountered	
Status for next flight	
Postflight requirements	
Comments	

Aero 3X	Aero 3X - Partially successful Check for 29 June 08
Status during flight (up/down)	
Accomplishments	
Issues encountered	
Status for next flight	
Postflight requirements	
Comments	

BBR	Worked Well – No Problems Check for 29 June 08
Status during flight (up/down)	
Accomplishments	
Issues encountered	
Status for next flight	
Postflight requirements	
Comments	

CAR & CANS	Worked Well – No Problems Check for 29 June 08
Status during flight (up/down)	
Accomplishments	
Issues encountered	
Status for next flight	
Postflight requirements	

Comments	
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CCN	OK	Check for 29 June 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

COBALT	Excellent	Check for 29 June 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

HIGEAR	Excellent Flight	Check for 29 June 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

AMS	1 Data Gap - Otherwise Good	Check for 29 June 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

PDS	Fully Operational	Check for 29 June 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

REVEAL & RTMM	Xchat ran for entire flight 4.0 hours	Check for 29 June 08
Status during flight (up/down)	Data Ops Links running fine	
Accomplishments	No Data to the B200	
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		

SSFR	Worked entire flight	Check for 29 June 08
Status during flight (up/down)		
Accomplishments		
Issues encountered		
Status for next flight		
Postflight requirements		
Comments		